AMENDMENTS TO THE CLAIMS

Please substitute the following pending claims 8-14, 22-60 as replacement claims for the previously-pending claims. In this Amendment B, claims 8, 9, 12, 13, 14, 22, 24, 26 have been amended, claims 15-21 have been canceled, and new claims 27-60 have been added.

1.-7. (CANCELED)

8. (CURRENTLY AMENDED) A method for ~~non-contact~~ dispensing ~~of a fluid~~liquid onto a substrate comprising the steps of:

a) providing an apparatus for ~~non-contact~~ dispensing ~~of~~ a ~~fluid~~liquid onto a substrate including:

i) a ~~hydrophilic~~ capillary, dimensioned for drawing a liquid therein in a volume less than about 10 microliters, said capillary having a tip end and an opposing end;

ii) a conduit in sealing fluid communication with the opposing end of said capillary;
~~a hydrophobic medium sealingly adjoining~~

iii) an interface between the tip end of said capillary and ~~defining an interface therewith~~said conduit, said interface being effective for resisting flow of said liquid into said capillary beyond said interface; ~~and~~

iv) the inner surface of said capillary being substantially hydrophobic between the tip and the interface;

v) a manifold, in sealing fluid communication with said conduit; and

vi) a source of ~~a~~ pressure for ~~ejecting fluids drawn into said capillary;~~applying pressure to said manifold;

b) drawing a liquid from a liquid source into said capillary substantially entirely by capillary action;

c) stopping the flow of said liquid substantially at said interface;

d) aligning said capillary with a predetermined location on said substrate; and

e) applying ~~a~~ pressure from said pressure source through said manifold and said conduit to said capillary for ejecting ~~fluids~~said liquid drawn into said capillary onto said substrate.

9. (CURRENTLY AMENDED) A method as in claim 8, wherein said source is adapted for delivering a pressure pulse and said step of applying a pressure includes applying a pressure pulse for ejecting ~~fluids~~liquids.

10. (PREVIOUSLY PRESENTED) A method as in claim 8, wherein said volume is less than about 5 microliters.

11. (PREVIOUSLY PRESENTED) A method as in claim 8, wherein said volume is less than about 2 microliters.

12. (CURRENTLY AMENDED) A method as in claim 8, wherein said hydrophobic ~~medium~~surface is at least partially formed of a polymeric material.

13. (CURRENTLY AMENDED) A method as in claim 8, wherein said apparatus further includes another capillary and each of the capillaries includes a tip for assisting in dispensing ~~fluids~~liquids and the tips of each of the capillaries are aligned in a common plane.

14. (CURRENTLY AMENDED) A method as in claim 13, wherein each of the capillaries is capable of delivering a different volume of ~~fluid~~liquid.

15.-21. (CANCELED)

22. (CURRENTLY AMENDED) A method for ~~non-contact~~ parallel dispensing of ~~fluids~~liquids onto a substrate for forming a library of materials comprising the steps of:

a) providing an apparatus for ~~non-contact dispensing of a fluid onto a substrate for forming a library of at least four different materials having a chemical gradient across said~~dispensing a liquid onto a substrate including:

i) a plurality of parallel ~~hydrophilic capillaries, each~~capillary systems, each of said plurality of capillary systems comprising:

1) a capillary, dimensioned for drawing a liquid therein in a volume less than about 10 microliters;

~~a hydrophobic sheath sealingly adjoining each of said capillaries and defining an interface therewith for resisting flow of said liquid into each said capillary beyond said interface;~~

~~a conduit upstream of said sheath associated with a manifold and being connected with said sheath; and~~, said capillary having a tip end and an opposing end;

2) a conduit in sealing fluid communication with said opposing end of said capillary; and

3) an interface, between the tip end of said capillary and said conduit, said interface being effective for resisting flow of said liquid into said capillary beyond said interface,

ii) a manifold in sealing fluid communication with said plurality of said conduits, and

iii) a source of ~~a pressure pulse~~ for ejecting, via said manifold, ~~fluids~~conduits and capillaries, liquids that are drawn into said capillaries~~;~~.

~~f)~~ b) drawing a liquid from ~~a~~one or more liquid ~~source~~sources into said plurality of capillaries substantially entirely by capillary action;

~~g)~~ c) stopping the flow of said ~~liquid~~liquids within said plurality of capillaries substantially at said interface and prior to reaching said ~~upstream conduit~~conduits;

~~h)~~ d) aligning said ~~capillaries with a predetermined location on said substrate; and~~plurality of capillaries with said substrate;

~~i)~~ e) applying a pressure pulse to said manifold, for ejecting ~~fluids~~said liquids drawn into said capillaries ~~simultaneously~~, onto regions of said substrate ~~for defining a library of materials without contacting said substrate with said capillary~~, and

f) forming a library of at least four different materials on said substrate.

23. (PREVIOUSLY PRESENTED) The method of claim 22, wherein said dispensing apparatus is mounted on a robotic arm.

24. (CURRENTLY AMENDED) The method of claim 22, wherein said ~~sheath~~conduit is maintained in place by heat shrinking.

25. (PREVIOUSLY PRESENTED) The method of claim 23, wherein said capillaries are each dimensioned for dispensing an amount of about 10 to about 500 nL.

26. (CURRENTLY AMENDED) The method of claim 25, wherein said ~~capillaries are~~capillary is polyimide coated fused silica, ~~said upstream~~and said conduit is ~~stainless steel, and said sheath is~~ PTFE.

27. (NEW) The method of claim 22, wherein said interface is created by a change in the inner surface of said capillary, resulting in a change in wettability of said liquid within said capillary.

28. (NEW) The method of claim 22, wherein the inner surface of said capillary is substantially hydrophobic from the tip to the interface.

29. (NEW) The method of claim 22, wherein the inner surface of said capillary is substantially hydrophilic from the tip to the interface.

30. (NEW) The method of claim 22, wherein the interface operates via a change in surface tension of said liquid.

31. (NEW) The method of claim 22, wherein the interface operates via a change in cross sectional area of said conduit relative to said capillary.

32. (NEW) The method of claim 31, wherein said conduit is smaller than said capillary.

33. (NEW) The method of claim 31, wherein said conduit is larger than said capillary.

34. (NEW) A method for parallel dispensing of liquids onto a substrate for forming a library of materials comprising the steps of:

a) providing an apparatus for dispensing a liquid onto a substrate, including a plurality of capillary systems, each capillary system comprising:

i) a capillary, dimensioned for drawing a liquid therein in a volume less than about 10 microliters, said capillary having a tip end and an opposing end;

ii) a conduit, in sealing fluid communication with said opposing end of said capillary; and

iii) an interface, between the tip end of said capillary and said conduit, said interface being effective for resisting flow of said liquid into said capillary beyond said interface,

iv) a source of pressure for ejecting, via said conduit, liquid that is drawn into said capillary;

b) drawing a liquid from one or more liquid sources into said capillaries substantially entirely by capillary action;

c) stopping the flow of said liquids substantially at said interface and prior to reaching said conduit;

d) aligning said capillaries with said substrate;

e) applying pressure to said conduits, for ejecting said liquids drawn into said capillaries, onto regions of said substrate;

f) forming a library of at least four different materials on said substrate.

35. (NEW) The method of claim 34, wherein said dispensing apparatus is mounted on a robotic arm.

36. (NEW) The method of claim 34, wherein said conduit is maintained in place by heat shrinking.

37. (NEW) The method of claim 35, wherein said capillaries are each dimensioned for dispensing an amount of about 10 to about 500 nL.

38. (NEW) The method of claim 37, wherein said capillaries are polyimide coated fused silica, and said conduit is PTFE.

39. (NEW) The method of claim 34, wherein said interface is created by a change in the inner surface of said capillary, resulting in a change in wettability of said liquid within said capillary.

40. (NEW) The method of claim 34, wherein the inner surface of said capillary is substantially hydrophobic from the tip to the interface.

41. (NEW) The method of claim 34, wherein the inner surface of said capillary is substantially hydrophilic from the tip to the interface.

42. (NEW) The method of claim 34, wherein the interface operates via a change in surface tension of said liquid.

43. (NEW) The method of claim 34, wherein the interface operates via a change in cross sectional area of said conduit relative to said capillary.

44. (NEW) The method of claim 43, wherein said conduit is smaller than said capillary.

45. (NEW) The method of claim 43, wherein said conduit is larger than said capillary.

46. (NEW) A method as in claim 8, wherein the inner surface of said capillary is substantially hydrophilic from the tip to the interface.

47. (NEW) A method as in claim 8, wherein said inner surface is an inorganic coating.

48. (NEW) A method as in claim 8, wherein said inner surface is an organic coating.

49. (NEW) A method as in claim 8, wherein said inner surface is a polymeric coating.

50. (NEW) A method for parallel dispensing of liquids onto a substrate comprising the steps of:

a) providing an apparatus for dispensing a liquid onto a substrate, including a plurality of capillary systems, each of the plurality of capillary systems comprising:

i) a microfabricated capillary feature, dimensioned for drawing a liquid therein in a volume less than about 10 microliters, said microfabricated capillary feature having a tip end and an opposing end;

ii) a conduit in sealing fluid communication with said opposing end of said microfabricated capillary feature;

iii) an interface, between the tip end of said capillary feature and said conduit, said interface being effective for resisting flow of said liquid into said capillary beyond said interface; and

iv) a source of pressure for ejecting, via said conduit and said capillary feature, liquid that is drawn into said capillary feature;

b) drawing a liquid from one or more liquid sources into said tip ends of said plurality of capillary features, substantially entirely by capillary action;

c) stopping the flow of said liquids substantially at said interfaces and prior to reaching said conduits;

d) aligning said microfabricated capillary features with said substrate; and

e) applying pressure to said conduit, for ejecting said liquids drawn into said plurality of capillary features, onto regions of said substrate.

51. (NEW) The method of claim 50, wherein said interface is created by a change in the inner surface of said capillary feature, resulting in a change in wettability of said liquid within said capillary feature.

52. (NEW) The method of claim 50, wherein the inner surface of said capillary feature is substantially hydrophobic from the tip to the interface.

53. (NEW) The method of claim 50, wherein the inner surface of said capillary feature is substantially hydrophilic from the tip end to the interface.

54 (NEW) The method of claim 50, wherein the interface operates via a change in surface tension of said liquid.

55 (NEW) The method of claim 50, wherein the interface operates via a change in cross sectional area of said conduit feature relative to said capillary feature.

56 (NEW) The method of claim 55, wherein said change in cross sectional area results in a conduit feature of smaller cross sectional area than that of said capillary feature.

57. (NEW) The method of claim 55, wherein said change in cross sectional area results in a conduit feature of larger cross sectional area than that of said capillary feature.

58. (NEW) The method of claim 50, wherein said capillary features are each dimensioned for dispensing an amount less than 100 nL.

59. (NEW) The method of claim 50, wherein said capillary features are each dimensioned for dispensing an amount less than 1 nL.

60. (NEW) The method of claim 50, wherein said capillary features are each dimensioned for dispensing an amount less than 10 pL.

[NO FURTHER AMENDMENTS THIS PAGE]